theory, which has rationalised the study of the races of mankind, and the discovery of quaternary man, which has extended human antiquity to a period long enough for the development-theory to work in. Dr. Tylor next proceeded to give an account of the Anthropological Society of Berlin, which, founded ten years ago, has, under the presidencies of Professors Virchow and Bastian, steadily risen to over 400 members, and has done admirable work. Its financial arrangements differ much from those of the English Society, it being housed by the State, and receiving an annual grant from the Minister of Public Worship, through which aid the members receive publications exceeding in value their moderate subscription. Among the contents of its publications for the last few years, special mention was made of the accounts of anthropoid apes in the Zoological Gardens of Germany. The life of Mafuka, who lived some time at Dresden, is among the most instructive of ape-biographies, as illustrating the approach of the anthropoid to the human mind. Knowing how to unlock her cage with the key, she stole and hid it for future use; she took the carpenter's bradawl and bored holes with it through her own table; when pouring drink from a jug into her cup, she would carefully stop short of overfilling it. Her death had an almost human pathos: she threw her arms round the neck of the director, Herr Schopf, kissed him, and then putting her hand in his, lay down and died. Mention was made of Dr. Kulischer's paper on sexual selection in primitive times, which collects more fully than has been done by previous writers, the evidence that a pairing time like that of the lower animals prevailed in rude human society, taking effect especially in festivals held in spring and autumn, as the times of returning warmth and plenty. On these occasions the great feature is the courting-dance, the often-unrestrained proceedings of which are not to be looked on as abnormal orgies, but as simply and undisguisedly natural, forming, indeed, part and parcel of the marriage-system of rude communal society. The courting-dance, though becoming more decorous with advancing culture, has held on with extraordinary tenacity through the history of society. In the middle ages it fully kept its connection with the season-festivals to which it especially belonged, curious relics of which still remain in European villages, for instance, the Ascension-Day festival near Gotha, where the dance under the linden-tree still marks the union of the peasant couples. Dr. Tylor added that the dances of the modern ball-room, however refined and ceremonious, show clear traces of descent from these ruder performances, not only in form, but in actual purpose.

Among matters of pre-historic archæology which of late have attracted attention in Germany are the "high-fields," or "heathen-fields," where the marks of ancient tillage are traced on ground now waste or forest-grown. These resemble the well-known "elf-furrows" of Scotland, but in neither country has the old agricultural race been identified. It is much the same with the "vitrified forts" once supposed to be peculiar to Scotland, but which are now found to be common in Central Europe. In a concluding general survey of the past year's work of the Anthropological Institute itself, particular stress was laid by Dr. Tylor on the contribution of new evidence for the Asiatic origin of the Polynesians, by Mr. Keane and Col. Yule; the minute examination of the Andaman islanders by Prof. Flower tending to prove them representatives of the primitive negro type; the Rev. J. Sibree's account of Malagasy relationships, where the indefinite use of such terms as father and mother points to an early stage of the idea of kinship; Dr. Tuke's investigation of De Rochas' theory that the Cagots of France and Spain owe their exclusion from society, not to being descendants of heretics, but of lepers, real or supposed; and Mr. Worthington Smith's collections increasing the area in England over which palæolithic man is now proved to have lived.

NOTES

WE are again enabled, by the courtesy of General Myer, to present our readers with one of those monthly weather maps for the northern hemisphere, of the value of which we have spoken on several occasions. The present map is for May, 1878, representing the mean pressure, mean temperature, mean force, and prevailing direction of wind, for that month. Our readers will find it both instructive and interesting, as is indicated in our Meteorological Notes this week, to compare it with the corresponding map for April of the same year, which we published in our number for January 29.

AN extraordinary prize of 3,000 francs has been awarded by the French Academy of Sciences to Mr. Crookes, F.R.S., in recognition of his recent discoveries in Molecular Physics and Radiant Matter.

WE are glad to learn that it is intended to commemorate, by a permanent memorial, the distinguished services rendered to science and education by Dr. Thomas Andrews, during the thirty years that he was occupant of the Chair of Chemistry in the Queen's College, Belfast. At a meeting of a highly distinguished character which was held in the Queen's College, it was resolved that the memorial should consist—"Firstly, of a portrait or bust to be placed in the College, and of a replica to be presented to Dr Andrews's family. Secondly, of a prize or scholarship to be founded in the Queen's College, Belfast, and awarded for high attainment in those sciences in which Dr. Andrews has achieved his distinction." We think that the form which the proposed memorial is to take will commend itself not only to Dr. Andrews's personal friends, but to the wider circle who appreciate his scientific work, and who desire to encourage the studies to which his life has been devoted. Subscriptions to the memorial are invited by the Executive Committee, and will be received by the treasurers, Mr. E. H. Clarke, Belfast Bank, and Mr. W. C. J. Allen, Ulster Bank, Belfast.

IT is announced as certain that M. Krantz, the director of the 1878 Universal Exhibition, will be appointed director of the Conservatoire des Arts et Métiers, and that many improvements will take place on the occasion of his appointment.

NEWS has reached Kew of the arrival of Prof. Bayley Balfour at Aden on January 24. In compliance with instructions from the Admiralty, Capt. Heron, of H.M.S. *Seagull*, arranged to convey Prof. Balfour to Socotra, and the latter hoped to start on February 1 or 2.

THE veteran French chemist, Sainte-Claire Deville, has resigned the professorship at the École Normale of Paris, after having filled it in the most brilliant manner for twenty-nine years. Of his manifold and classical investigations during this period, the most noteworthy were those on aluminium, which, supported by Napoleon III., led to the creation of the aluminium industry; the adaptation and application of the same metallurgical processes to magnesium which created likewise the industry of this metal, and the extensive researches on platinum and its allied metals in company with Debray, in the course of which platinum was fused for the first time. Although, perhaps, of less financial value, still the results obtained by Deville in inorganic chemistry may fairly be placed at the side of the remarkable contributions of his fellow *savant* Pasteur, in the biological department of the same science. His successor is Prof. Troost, whose career as an investigator dates back some twenty-five years. He has likewise confined his attention almost exclusively to the problems of inorganic chemistry, and is best known by long-continued and exhaustive studies on the phenomena of heat connected with chemical reactions.

THE *American Naturalist* states that the report of the Curator of the Harvard University Museum of Zoology, where geology is also taught, shows that facilities are extended to those desirous of studying lithology. The instruction given by Mr. M. E. Wadsworth during the past year consisted of lectures on the macroscopic and microscopic characters of the rocks and their constituent minerals, and also of field and laboratory work. Besides the study of the laboratory collections, each student had assigned to him a separate district, which he was to map, studying the characters and relations of the rocks, and collecting the necessary specimens. Of the rocks thus collected the student was required to make thin sections and to examine them microscopically, writing a thesis upon the whole work. It was intended that the course should be sufficiently thorough to fit the student for practical field and laboratory research.

THE prospectus is issued of a proposed *Botanisches Centralblatt*, to be published weekly by Fischer, of Cassel, under the editorship of Dr. O. Uhlworm, of Leipzig. The object of the publication is to supply brief abstracts (without criticism) weekly of every important new independent publication or paper in a scientific journal, in all the various branches of botanical science; a complete index to titles of recent botanical literature in all countries; short original communications; reports of museums, gardens, botanical explorations, &c.; personal news, &c., &c. The editor has secured the co-operation for this purpose of correspondents in the various towns of Germany and France, England, Switzerland, Sweden, Servia, Denmark, Greece, Russia, Belgium, Holland, &c., &c. All communications should be addressed to Dr. O. Uhlworm, Südstrasse, 82, Leipzig, who invites the assistance of botanists in all countries to render the publication as complete and useful as possible.

A FEW alterations have been made in this year's curriculum of the École d'Anthropologie at Paris, which is now divided into a winter and summer session. Dr. Paul Broca is delivering a course of comparative anatomy, while Dr. Paul Topinard is conducting the biological section of the class for anthropology, and M. Gabriel de Mortillet that of human palæontology. The summer session will begin in April, with lectures on ethnology by Dr. Dally, on language in relation to anthropology by Dr. Hovelacque, and on demography by Dr. Bertillon.

HERR LISSAUER, in exploring the so-called "Reihengräber" near Culm, on the Weser, has found about seventy graves, not previously opened. In these the bodies were found lying in rows on the bare ground, and besides bronze and iron knives, amber, agate, and other beads, rings of an oval form, varying in diameter from 30 to 80 millim., were discovered on either side of each skull. These singular objects, to which the name of "Hackenringe" has been given from their hooked form, have never before been found at any but a purely Slave-station. In Poland there is evidence that their use was continued till the middle of the eleventh century, but hitherto no light has been thrown on the purpose for which they were intended. The crania found in these graves differed from the brachiocephalic type of the Slaves, and approached more closely to that of the mesaticephalic ancient inhabitants of Western Prussia.

A SMALL crater is stated to have appeared near Paterno, on the west side of Etna, and the other craters are again issuing a saltish oily fluid, which has formed a small lake and is injuring the neighbouring fields. Numerous slight shocks of earthquake have also been felt to the north-north-east and south-south-west of Etna; jets of steam have issued from the new craters, and steam, mixed with ashes, from the central one.

THE principles of sanitary science appear to have received but small attention in the Riviera, for, according to the sanitary commissioner of the *Morning Post*, who has just concluded a series of articles on the result of his examination of the condition of the part between Cannes and San Remo, they are everywhere disregarded. The more important facts he gives are these: As there are nowhere any sewers, the cesspool system is all but universal, and cesspools are often under the houses and have faulty ventilating pipes. There are but few public water supplies, and even where these are available they are not always used, wells, even in suspicious positions being used instead. There are two distinct sets of dangers which must be regarded quite apart. There are the dangers to villas and hotels, wherever situated, from defective cesspools, internal arrangements, and wells, and there are especial dangers in towns from the *égouts*. The dangers of villas and hotels are not under inspection, and people occupying them have no other assurance of safety than having them examined for themselves. The examination should be extended to the overflows from buildings on higher ground, which it appears the law does not prohibit. Many even of the best hotels are in a very unsatisfactory state. The ventilating pipes of cesspools frequently end by bed-room windows; wells are situated in places liable to pollution, while internal arrangements are dangerously faulty. The greatest dangers of all, however, are the *égouts* in towns. Originally intended only as drains for rain-water and waste house-water, they in reality receive the overflows of cesspools, and as they are never flushed and have but a very slight gradient, the matter hangs about in them and ferments, thus becoming a source of grave danger, as the air from the *égouts* rises into the streets through untrapped openings. The commissioner states that he has arrived at the real facts regarding the *égouts*, in spite of much official misinformation, and that he was three times laid up from working out the facts for himself. Although told at official bureaux that overflows did not exist because they were forbidden by law, he had some cesspool covers opened, saw the overflows, and then, from extended inquiries, found that the law was habitually disregarded, as the fine for an overflow was never enforced. English visitors thus know for the first time that *égouts* are not mere drains, as officially stated, but are worse than sewers. The beaches and promenades near the sea are especially dangerous, as the sands are becoming sodden with sewage matter, and the almost tideless bays are getting choked up with it. There are numberless private *égouts*, while the larger public *égouts* open on to the shores without any flaps or doors to them, so that the fouled air is wafted back to the public gardens and the favourite shore promenades. The one piece of advice offered to visitors is that they should select hotels or villas away from the shore and away from *égouts*.

AN International Meteorological Conference has been held in Sydney, at which it has been arranged to establish a uniform system of weather telegraphy for the different Australian colonies.

PROF. MILNE, of Tokio, Japan, has devised an ingenious method of detecting the least seismic trembling. In an article in the *Japan Gazette* for December 13, 1879, he thus describes his method:—"Besides endeavouring to obtain the true motion of any earth particle, I have, for special reasons, been endeavouring to obtain records of the smaller shakings. By the use of a special form of microphone when it is properly placed it is not difficult to detect any movement, however slight, of the earth's crust. My microphones are buried in pits round about the house. Precautions have been taken to keep out insects, otherwise the tramping of a beetle would register as an earthquake. The pits must also be dug at a distance from a roadway or path, otherwise every step of persons passing, even if six yards distant, will be indicated to the recorder. Excluding beetles, thieves, and unexpected visitors, it would seem that for some time before the occurrence of a 'shock' the telephone gives signs that the earth is crackling as if under an increasing strain; these indications continue for uncertain periods, but they have been distinctly noticeable before the last few earthquakes. It would seem that the power of resistance of the earth before any surface movement is felt is very great, but, at last, like a bending stick, it suddenly breaks, and the jar gives the vibrations which we call an earthquake. If these 'crackles' can be detected we shall then have the means of approximately foretelling when the consequent crash is at hand. The observations of these 'crackles' which, so far as I am aware, have hitherto been studiously avoided or else unfortunately neglected, would also tell us something definite about periodicity. From my observations I feel certain that there are many small earthquakes which ordinary instruments pass by unnoticed. The consequence is that, when we attempt to correlate earth motions with those of, say, for instance, the moon, we do not find the accordance we should expect; the attraction of the moon has not been sufficiently great to overcome the elasticity of the earth's crust, and to cause shocks great enough to be recorded upon the usual instruments. If, however, instruments still more delicate are used, we shall find little earthquakes, or what I prefer to call earth tremors recorded in those places where we have been unsuccessfully looking for big ones. We shall, in fact, detect the little straws which are being piled up in regular order and which will eventually break the camel's back."

In his just published report H.M.'s Consul at Yokohama states that the experiment made during the two previous years of manufacturing black teas for the English market has been attended with such disappointing results to all concerned that the industry is not likely to be persevered in for the future.

The Birmingham Philosophical Society, at a meeting on February 12, did themselves the honour of electing Mr. Charles Darwin an honorary member and presenting him with an address on the occasion of his seventy-first birthday, the day of meeting.

Capt. Oliver desires us to state that in his letter in Nature, vol. xxi. p. 348, he wrote by mistake, in referring to Halley's work, *official* for *optical*.

We have on our table the following books:—"A Rule of Proportion," Dr. John Marshall (Smith, Elder); "Anatomy for Artists," Dr. John Marshall (Smith, Elder); "Der Realismus der modernen Naturwissenschaft," Dr. Anton von Leclair (Williams and Norgate); "Wave and Vortex Motion," Thomas Craig (van Nostrand); "Scotch Live Stock," James Bruce, (Edmonston and Co.); "Géologie Expérimentale," A. Daubrée; "Primer of the Industrial Geography of Great Britain and Ireland," G. P. Bevan (Sonnenschein and Allen); "Nile Gleanings," Villiers Stuart (John Murray); "Memoirs of Dr. P. P. Carpenter," Russell L. Carpenter (C. Kegan Paul); "Rural Bird Life," Charles Dixon (Longmans); "Hot Air," Richard Metcalf; "Ceylon Coffee Planters' Association," John Hughes; "Lethæa Geognostica," F. Roemer (E. Koch); "Biological Atlas," D. and A. N. M'Alpine (W. and A. K. Johnston); "Physical Geography," E. W. Lewis (Moffatt and Paige); "The Unity of Matter," A. S. Wilson (Samuel Highley); "The Art of Perfumery," G. W. S. Piesse (Longmans); "Who are the Irish?" James Bonwick (Bogue); "Das Protoplasma," Dr. Johannes v. Haustein (Carl Winter); "The Spectroscope in Medicine," C. A. McMunn (Churchill); "Zoology," A. S. Packard (H. Holt and Co.); "The Comstock Lode, its Formation and History," J. A. Church (J. Wiley and Son); "Handbuch der Botanik," Dr. N. J. C. Müller (Carl Winter); "River of Golden Sand," 2 vols., Capt. Gill (John Murray); "Chapters from the Physical History of the Earth," A. Nicols (Kegan Paul); "Medicinal Plants," parts 38, 39, 40, and 41, Robert Bentley and H. Trimen (Churchill); "Lange's History of Materialism," vol. 2, E. C. Thomas (Trübner); "Linkages," J. D. C. de Roos (van Nostrand); "Theory of Solid and Braced Elastic Arches," William Cain (van Nostrand); "On the Motion of Solid in a Fluid," Thomas Craig (van Nostrand); "Lucernariæ and their Allies," H. J. Clark (Washington).

The additions to the Zoological Society's Gardens during the past week include a White-fronted Lemur (*Lemur albifrons*) from Madagascar, presented by Mr. W. C. Gordon; a Macaque Monkey (*Macacus cynomolgus*), a Rhesus Monkey (*Macacus erythræus*) from India, presented by Mr. J. Snowden Henry, F.Z.S.; two Hawk-headed Caiques (*Deroptyus accipitrinus*) from Brazil, presented by Mr. Chas. Frieke; a Spur-winged Goose (*Plectropterus gambensis*) from West Africa, presented by Mr. R. B. Dobree; a Peregrine Falcon (*Falco peregrinus*) from Newfoundland, presented by Mr. F. R. Haynes; a Robben Island Snake (*Coronella phocarum*) from South Africa, presented by Mr. W. Porter; a Bewick's Swan (*Cygnus bewicki*), North European, two Sharp-nosed Crocodiles (*Crocodilus acutus*) from Jamaica, deposited; a Serval (*Felis serval*) from West Africa, purchased.

OUR ASTRONOMICAL COLUMN

The Comet of 1577.—For more reasons than one the comet which was observed at the end of 1577 and beginning of 1578 deserves prominent mention in the history of these bodies. It must have been the brightest comet of the sixteenth century, visible even in full sunshine, as we know from the testimony of Tycho Brahe, and it was from his careful observations of it, made at a critical time in the discussion as to the nature and distance of comets, that he proved it to have a much smaller parallax than the moon, and hence to be situated far beyond our satellite. Tycho's observations formed part of a work which, though it appears to have been completed so far as it referred to the comet in 1588, and copies distributed by Tycho to his friends in that year, was not published in the full sense of the term until 1603, when it was brought out at Prague after his death, under the care of his son-in-law. The work is entitled "Tychonis Brahe, Dani, De mundi ætheri recentioribus phænomenis liber secundus, qui est de illustri stella caudatâ anno 1577 conspectâ." In 1648 it was reprinted at Frankfort in the collective edition of Tycho's works. Pingré refers to the inaccuracy with which the observations of the comet were given in this edition, which served him for his *Cométographie*, but he thought he had discovered and corrected all the errors in his transcript of the observations for that work (vol. i. pp. 513–16).

The comet was seen in Peru as early as November 1, according to an historical work composed in 1589 by the Jesuit Joseph de Acosta, and about the same time, perhaps a day later, in Japan, as we learn from Kaempfer. It was seen in various parts of Europe on November 10, 11, and 12, and on November 13 Tycho observed it for the first time at Uraniburg, his observatory in the island of Huen. His experiences with regard to the comet are detailed in the work we have referred to. He thus describes his discovery of it: "Having gone out some time before sun-set, and while waiting supper, to amuse myself with witnessing the taking of fish from one of my ponds, I occupied myself while the net was being drawn, in surveying the western part of the sky, to see if the purity of the air promised for that night my usual pleasure of observing the stars. As I was least expecting it, I perceived in that direction a certain bright star, which appeared as distinct as Venus, when near to the earth and when seen before sunset or after sunrise. For the rays or *chevelure* of the star could not yet be perceived, the sun, still above the horizon, entirely obliterating the feeble brightness of its rays." Tycho then describes how he was astonished at the visibility of an unknown object of such brightness as to strike the eye while it was yet daylight; he was sure that there was no planet in that quarter of the sky excepting Saturn, which could not be seen in sunshine, and as to the fixed stars, he knew they were none of them visible under such circumstances. He asked those about him whether they saw an object in the direction he pointed out, and they replied it was perfectly distinct, and must be Venus because no other planet could be so conspicuous in daylight. Tycho, however, assured his friends that Venus was not in that part of the sky, and said it would be found as it grew darker that "aliquid insoliti admirandique" was there shining. Accordingly, as soon